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सड़क वाहन — संघट्ट वर्गीकरण — शब्दावली

(पहला पुनरीक्षण)

Indian Standard

ROAD VEHICLES — COLLISION CLASSIFICATION — TERMINOLOGY

(First Revision)

ICS 01.040.43; 43.020

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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NATIONAL FOREWORD

This Indian Standard (First Revision) which is identical with ISO 6813 : 1998 'Road vehicles — Collision classification — Terminology' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Automotive Body, Chassis, Accessories and Garage Equipment Sectional Committee and approval of the Transport Engineering Division Council.

This standard was first published in 1992 under dual number. This revision was undertaken to completely align with ISO 6813 : 1998 under the dual numbering system.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker, while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

Only the English language text has been retained while adopting it in this Indian Standard, and as such the page numbers given here are not the same as in the International Standard.

In this adopted standard, reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is listed below along with its degree of equivalence for the edition indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 612 : 1978 Road vehicles — Dimensions of motor vehicles and towed vehicles — Terms and definitions	IS 9435 : 1980 Terms and definitions relating to dimensions of road vehicles (*first revision*)	Technically Equivalent

The technical committee responsible for the preparation of this standard has reviewed the provisions of the following International Standards and has decided that they are acceptable for use in conjunction with this standard:

International Standards	*Title*
ISO 4130 : 1978	Road vehicles — Three-dimensional reference system and fiducial marks — Definitions
ISO 6549 : 1999	Road vehicles — Procedure for H- and R-point determination

Indian Standard
ROAD VEHICLES — COLLISION CLASSIFICATION — TERMINOLOGY
(First Revision)

1 Scope

This International Standard defines terms relating to the classification of road vehicle collisions, concentrating on configuration aspects. Additional terms and definitions on road vehicle accidents are given in ISO 12353-1.

2 Normative reference

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 612:1978, *Road vehicles — Dimensions of motor vehicles and towed vehicles — Terms and definitions.*

ISO 4130:1978, *Road vehicles — Three-dimensional reference system and fiducial marks — Definitions.*

ISO 6549:—[1], *Road vehicles — Procedure for H-point determination.*

3 Definitions

3.1
road vehicle accident event
collision or non-collision event which is part of a **road vehicle accident** (see ISO 12353-1)

See figure 1

3.1.1
single event accident
accident consisting of one accident event only

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[1] To be published. (Revision of ISO 6549:1980)

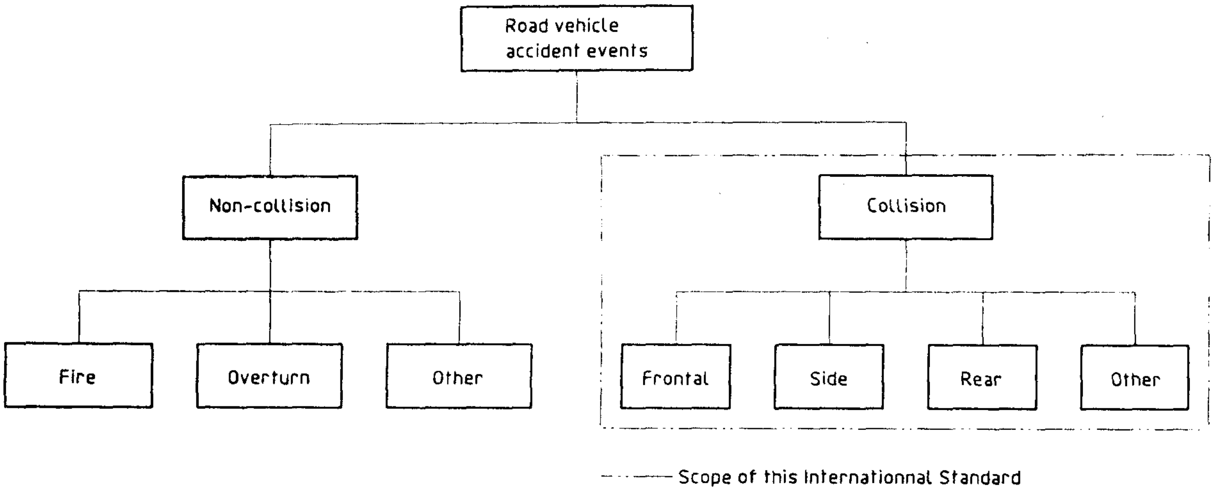

Road vehicle accident events
Non-collision
Collision
Fire
Overturn
Other
Frontal
Side
Rear
Other
Scope of this Internationnal Standard

Figure 1 — Road vehicle accident events

3.1.2
multiple-event accident

accident sequence consisting of more than one accident event

EXAMPLE — Collision + overturn

3.2
non-collision

road vehicle accident event which is not associated with a **collision** (3.3)

EXAMPLES — Non-collisions include overturn, jack-knifing, trailer disconnection, loss of load, fall from a vehicle, etc.

3.2.1
overturn

single-vehicle accident event in which the vehicle rolls at least 90°

NOTE — This term can be used to describe a **rollover** or a **pitchover** (see ISO 12353-1).

3.3
collision

road vehicle accident event in which a vehicle strikes, or is struck by, another vehicle, road user, or an obstacle, with ensuing damage and/or injury

3.3.1
collision configuration

position of the collision participants in relation to each other in a fixed coordinate system at the time of their initial contact

NOTE — The configuration does not indicate direction of vehicle travel. From a configuration point of view, a collision is characterized by the following factors:

— **collision type** (3.3.1.1);

— **collision angle** (3.3.1.2, 3.3.1.3);

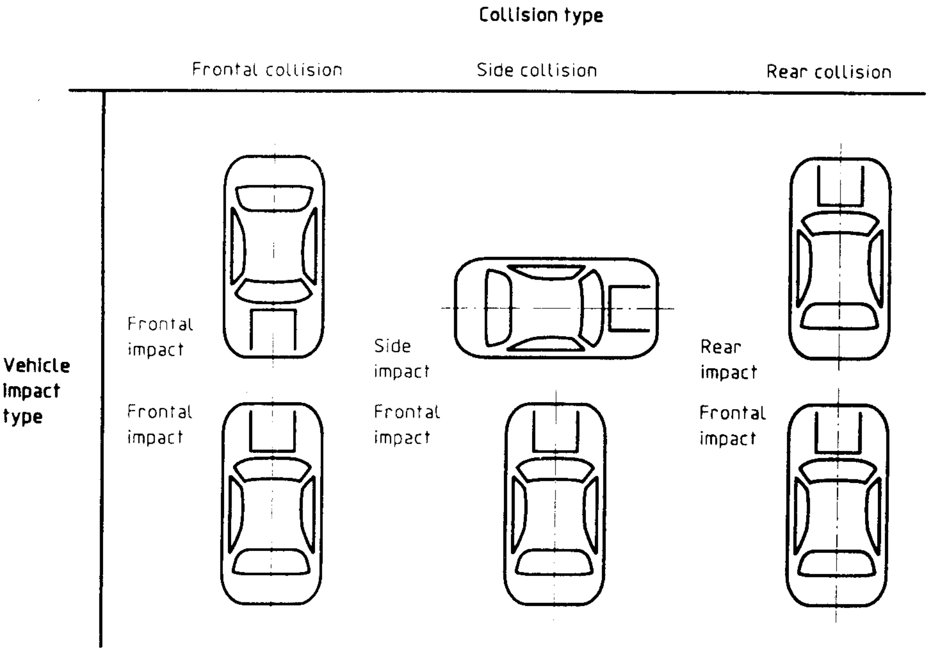
— **axis alignment** (3.3.1.4).

3.3.1.1
collision type

categorization of a collision based on the types of **impact** (3.4) for the vehicle(s), road user(s), and obstacle(s) involved

See figure 2.

NOTE — Each collision type, as defined in 3.3.1.1.1 to 3.3.1.1.6, may be oblique and/or **offset** (3.3.1.4.1).



NOTE — **Collision type** (3.3.1.1) is used to describe a collision with respect to all vehicles, road users, and collision obstacles involved, while **impact type** (3.4.1) is used to describe an impact event relating to a specific vehicle involved.

Figure 2 — Collisions between two vehicles: basic collisions and impact types

3.3.1.1.1

frontal collision between two vehicles

collision in which both vehicles undergo a **frontal impact** (3.4.1.1)

3.3.1.1.2

frontal collision between a vehicle and an obstacle

collision in which the vehicle undergoes a frontal impact

3.3.1.1.3

side collision between two vehicles

collision in which at least one vehicle undergoes a **side impact** (3.4.1.2)

3.3.1.1.4

side collision between a vehicle and an obstacle

collision in which the vehicle undergoes a side impact

3.3.1.1.5

rear collision between two vehicles

collision in which one vehicle undergoes a **rear impact** (3.4.1.3), the other a frontal or a rear impact

3.3.1.1.6

rear collision between a vehicle and an obstacle

collision in which the vehicle undergoes a rear impact

3.3.1.2

collision angle between two vehicles

α

angle measured between the two vertical longitudinal zero planes (see ISO 4130) of the vehicles involved

NOTE — The angle should be measured between 0° and 180° (indicating left or right), starting from the vehicle which defines the collision type; see figure 3.

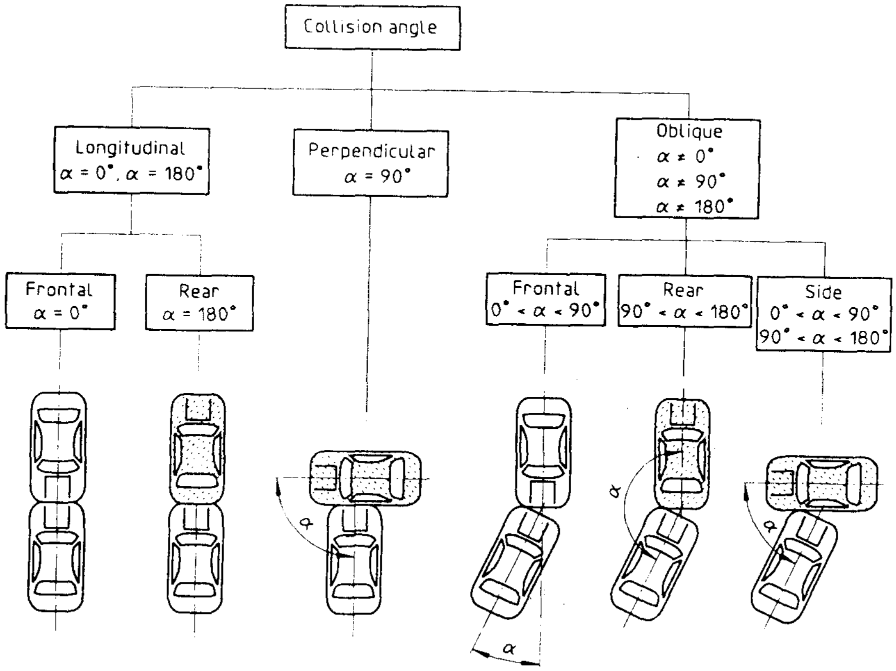
3.3.1.3

collision angle between a vehicle and an obstacle

α

angle measured between the vertical longitudinal zero plane of the vehicle and the vertical plane perpendicular to the obstacle's surface at the contact point

See figure 4.



Shaded vehicle = vehicle which defines the collision type

Figure 3 — Collision angles between two vehicles

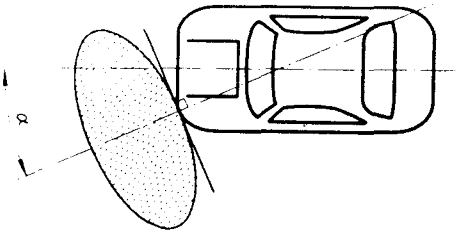


Figure 4 — Oblique collision between a vehicle and an obstacle

3.3.1.4

axis alignment

state in which the main planes of the two vehicles or the vehicle and the obstacle involved in a collision are the same

See figures 5, 6, and 7.

NOTES

1 The main planes are identified as:

- in a longitudinal collision, the vertical longitudinal zero plane of each vehicle;
- in a perpendicular collision, the vertical longitudinal zero plane for the vehicle undergoing a frontal impact and the vertical transverse plane for the vehicle undergoing a side impact. Depending on the purpose, the transverse plane can go through, for example, the centre of gravity, through the driver's R-point (according to ISO 6549), or through the centre of the length of the struck vehicle.

2 A non-aligned collision is "offset".

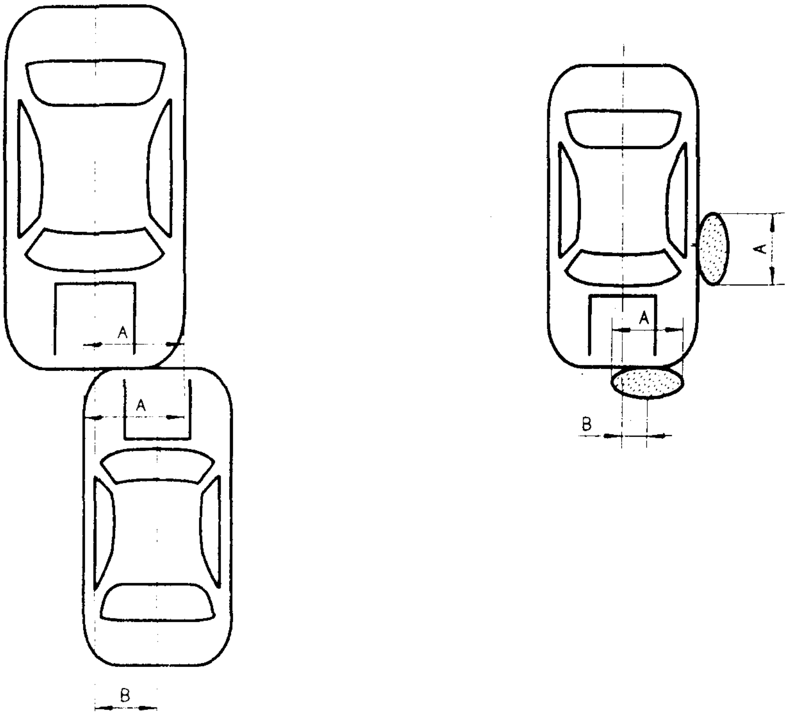
3.3.1.4.1

offset

short distance measured perpendicularly between the main planes of the vehicles involved in a non-aligned collision

NOTE — The offset is always related to the collision type. In the case of oblique collisions, it is also related to the vehicle impact type (depending on which vehicle is being considered as the "case" vehicle).

Examples are shown in figures 5, 6, and 7. See also the note in 3.3.1.5.



Key

A: overlap
B: offset

Figure 5 — Offset and overlap

3.3.1.5
overlap

measurement of the area covered by the striking/struck vehicle or struck obstacle in a collision

See figure 5.

NOTE — Overlap is related to a specific vehicle in a collision.

The overlap can be expressed as the portion of front, side, or rear end involved. Overlap measurements can be given either as a distance or as a percent. A percentage overlap should be based on the **vehicle width** (ISO 612:1978, 6.2), excluding the side mirrors, for front and rear impacts and **vehicle length** (ISO 612:1978, 6.1) for side impacts.

In accordance with the definition, an offset measurement is given as a distance only. The common misuse in which an overlap percentage is expressed as "offset" should be avoided. For example, a "30 % offset impact" should be rephrased as "an offset impact with an overlap of 30 %".

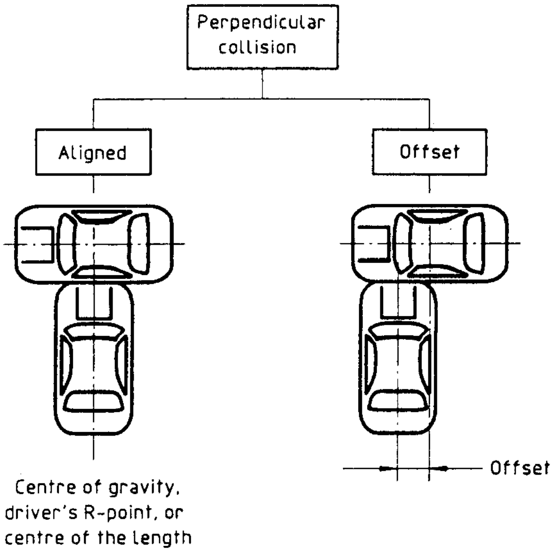

Perpendicular collision
Aligned
Offset
Offset
Centre of gravity, driver's R-point, or centre of the length

Figure 6 — Offset measurements in perpendicular collisions

3.4
impact

sudden contact between a vehicle and another vehicle or an obstacle, characterized by

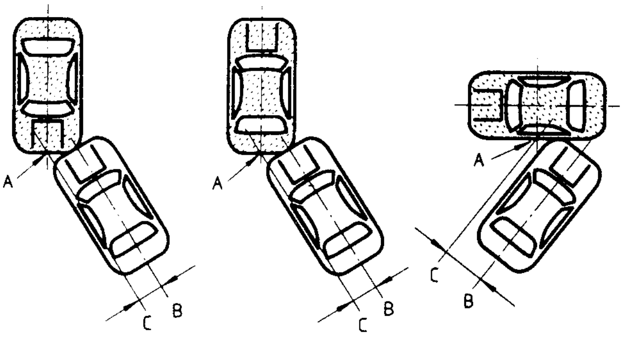
— **impact type** (3.4.1),

— **principal force** (3.4.2),

— **deformation** (3.4.3)

See figures 2 and 8.

NOTE — The term **impact** relates to a specific vehicle involved in a collision. A classification system relating to the above impact factors is given in SAE J 224 (for cars) and SAE J 1301 (for trucks).



Key

A Outer limit of the vertical zero plane (longitudinal or transverse) of the "case" vehicle (shaded)
B Vertical longitudinal zero plane of the other vehicle (not shaded)
C Vertical plane parallel to B through A.

The offset (for the case vehicle) is measured between C and B.

Figure 7 — Offset measurements in oblique collisions

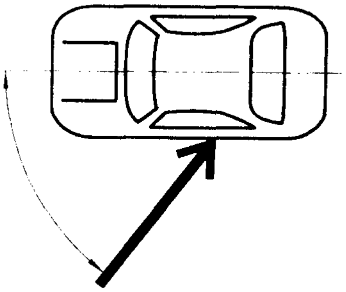


Figure 8 — Point and direction of principal force

3.4.1
impact type

categorization of an impact based on the predominant area of the vehicle on which the principal force acts

3.4.1.1
frontal impact

impact in which the principal force acts predominantly between the front corners of the vehicle

3.4.1.2
side impact

impact in which the principal force acts predominantly between the side corners of the vehicle

3.4.1.3
rear impact

impact in which the principal force acts predominantly between the rear corners of the vehicle

3.4.2
principal force

resultant of the forces acting to deform and displace the vehicle at the moment of impact

3.4.2.1
point of principal force

point of the vehicle where the principal force has acted

3.4.2.2
direction of principal force
PDOF

direction of the vector along which the principal force is applied to the vehicle

NOTE — The direction is measured between two vertical planes, one of which contains the vertical longitudinal zero plane of the vehicle and the other contains the principal force acting on the vehicle. The angle is measured from the longitudinal zero plane of the vehicle, indicating left or right, and should not exceed 180° (see figure 8). Alternatively, a clock diagram according to SAE J 224 and SAE J1301 can be used.

3.4.3
deformation

displacement, due to impact, of an area or structure on a vehicle with respect to local vehicle coordinates

NOTE — A classification system relating to main deformation zones is given in SAE J224 and SAE J1301.

Annex A
(informative)

Bibliography

[1] ISO 12353-1:—[3], *Road vehicles — Traffic accident analysis — Part 1: Terminology.*

[2] SAE J 224:1980, *Collision Deformation Classification.*

[3] SAE J 1301:1994, *Truck Deformation Classification.*

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[3] To be published.

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